Notes.

At a special meeting of the Institution of Electrical Engineers, to be held on May 31, a proposal will be submitted to the members that the institution shall petition the Privy Council for a charter of incorporation. More than forty years ago, when the institution was a small and struggling society, it applied for a charter, but the application was successfully opposed by the Institution of Civil Engineers. Now that the importance of electrical engineering to the community is recognised, and the good work that the institution has done in developing electrical science and its applications is well known, there is no reason to anticipate that there will be any opposition to the grant of a charter. The only point where discussion is likely to arise is in connection with the clause which proposes to confer upon corporate members of the institution the right to use the designation "chartered electrical engineer." We take it that the object of this clause is to distinguish between an electrical engineer and a man who, having some slight technical qualification, calls himself one. We think the proposal unnecessary. The public recognises that the letters M.I.E.E. are a complete qualification.

Telephonic communication has now been established between Cuba and the United States by three separate cables, each of which is more than a hundred miles in length and is submerged to a depth of 1000 fathoms. Owing to the large electrostatic capacity of submarine cables distinct speech through them would be impossible were not the circuit made inductive so as to secure the practically "distortionless circuit" first described by Oliver Heaviside. In the submarine portion of the London-Paris telephone circuit "lumped inductance" is added by inserting Pupin inductance coils at short intervals. In the Havana and Key West cables the copper core is surrounded by a continuous spiral of fine iron wire insulated by a sheathing of gutta-percha. The inductive loading is thus continuous, and so the necessary mathematical conditions can be more accurately fulfilled. Above the gutta-percha is wound a copper tape as a protection against the attacks of the teredo. Over this shield is wound a further copper tape, which forms the return half of the telephone circuit of each cable. The specifications for the cables were prepared by Sir William Slingo, formerly Engineer-in-Chief of the British Post Office, in conjunction with the Western Electric Co.

We learn from the publication, *Radium*, that Mme. Curie left France on May 7 on a visit to the United States, the main purport of her visit being to receive a gift of one gram of the element radium from the women of the United States. The gift was organised by Mrs. William Brown Meloney, the editor of the *Delineator*, and carried into effect by the Marie Curie Radium Fund Committee. From a report in the *Times* of May 21 it appears that this presentation was made to Mme. Curie at the White House, Washington, at the hands of President Harding. In an eloquent and felicitous address the President referred to the benefits conferred upon humanity by discoveries in science. It is, as he said, given to relatively few to make great discoveries, and the recognition given to those who do so is often meagre enough. In a happy phrase he reminded his audience that "the great things achieved by great minds would never have been wrought without the inspiration to successful effort, and success in turn enables the outgiving of benefits to millions whose only contribution has been the power of their united appeal." We understand that Mme. Curie is to be the recipient of several honorary degrees on the occasion of her visit to America.

The importance of regular meteorological reports from Greenland for the forecasting services of Western Europe, and, indeed, for that of Canada also, has been recognised for some years. The question of these reports was discussed at the meeting of the International Commission for Weather Telegraphy which was held in London in November last, and the Commission decided unanimously that "the establishment at the earliest possible date of a high-power radio-telegraphic station in Greenland is of the utmost importance to the meteorology of Western Europe, and, further, it is of such importance as to warrant the international provision of funds for maintaining it." It is probable that the provision of such a station by the Danish Government will be made at an early date. When this station has been provided it will be possible to make a definite use in weather forecasting in Europe of meteorological observations from Canada and the United States. Hitherto the gap between the European and American observations has been so great that meteorologists have been unable to justify the expense which would be involved in regular cable messages from America to England.

Dr. E. J. Russell, director of the Rothamsted Experimental Station, has been appointed a foreign corresponding member of the Reale Istituto Lombardo di Scienze e Lettere di Milano.

Dr. F. L. Golla will deliver the Croonian lectures of the Royal College of Physicians on Tuesdays and Thursdays, June 9, 14, 16, and 21, at 5 o'clock, upon the subject of "The Objective Study of Neurosis."

Notice is given by the Institute of Physics that the first examination of candidates for the associateship of the institute will be held at the latter end of September next. Forms of application are obtainable from the Secretary, 10 Essex Street, W.C.2. Applications for entry must be received before June 15.

A public meeting arranged by the National Union of Scientific Workers will be held in the Botanical Theatre, University College, Gower Street, on Monday next, May 30, when Prof. L. Bairstow will speak on the subject of "The Administration of Scientific Work." The chair will be taken at 8 p.m. by the Right Hon. Viscount Haldane.

The Principal Trustees of the British Museum have appointed Dr. W. T. Calman to be deputy keeper in the department of zoology. Dr. Calman, who graduated as a Doctor of Science at St. Andrews University, has been in charge of the Crustacea at the Natural History Museum since 1904, and is the author of "The Life of Crustacea" and of numerous articles on this group.

A MEETING on the subject of "Constructive Birth Control: Its Ideals and Helpfulness to the Individual and to the Race" will be held at Queen's Hall on Tuesday next, May 31. The chair will be taken at 8.30 by the Right Hon. G. H. Roberts, and among the speakers will be Dr. Jane L. Hawthorne, Dr. C. Killick Millard, the Right Hon. J. M. Robertson, Admiral Sir Percy Scott, and Dr. Marie Stopes.

THE Ottawa Field-Naturalists' Club has decided to open a subscription list for a permanent memorial to the late Prof. John Macoun, naturalist of the Geological Survey of Canada, who died at Sidney, British Columbia, on July 18, 1920. The wide field of work to which Prof. Macoun devoted his life is known to many naturalists. He specialised particularly in botany, and was the founder of the Canadian National Herbarium. Other sciences, however, especially zoology, were also greatly enriched by him. He will be remembered as the great pioneer in Canadian natural history. The memorial will take the form of a portrait to be hung in the Victoria Memorial Museum, which will be executed by Mr. Franklin Brownell, of Ottawa. The expenses in connection therewith will be about 700 dollars, and subscriptions, which should be forwarded to Mr. Arthur Gibson, Dominion Entomologist, Ottawa, are invited.

THE third meeting of the Council of Agriculture for England, constituted by the Ministry of Agriculture and Fisheries Act, 1919, will be held at the Middlesex Guildhall, Westminster, S.W., on Friday, May 27. The proceedings will begin at 11 a.m. and will be open to the public. The Earl of Selborne, K.G., will be in the chair. The purpose of the council is to provide an opportunity for the discussion of matters of public interest relating to agriculture and other rural industries by persons representing the various interests of the industry from all parts of the country. Several interesting resolutions will be considered, among which may be mentioned two to be moved by Sir Douglas Newton, dealing with the facilities of railway goods stations for the rapid transit of soft fruit and other perishable produce. The question is especially difficult at the present time, when railway services have to be curtailed.

IN connection with the presentation on June 29 of the John Fritz medal to Sir Robert Hadfield, which was announced in NATURE of May 5, it may be of interest to record the events which led to the institution of this medal. In 1902 a number of friends and associates of John Fritz, the American engineer who brought about great changes in the iron and steel industry in the United States, decided to celebrate his eightieth birthday by establishing a fund, the income from which should be used to strike annually a John Fritz medal for scientific and industrial achievement in any field of pure or applied science. A committee consisting of representatives of the American Societies of Civil and Mechanical Engineers and the American Institutes of Mining and Electrical Engineers was appointed, and an impression of an appropriate design was presented to John Fritz at a great dinner given in the Waldorf Hotel, New York. After the die had been completed the committee continued in existence as the John Fritz Medal Fund Corporation. One member of each of the societies instrumental in founding the fund is now elected annually to serve on the committee for a period of four years; the members of the committee also act as a board of award. The medal, which is of gold, is awarded annually, without restriction on account of nationality or sex, and it is accompanied by a diploma reciting the origin of the medal and the specific achievement for which the award is made. The first award, in 1902, was made to John Fritz, and the second, in 1905, to Lord Kelvin, "for work in cable telegraphy and other general scientific achievements." Since then an award has been made every year with the exception of 1913, and the list of recipients contains such well-known names as George Westinghouse, Dr. Alexander Bell, Thomas A. Edison, Sir William H. White, and Elihu Thomson.

THE second issue, that for April, of the *Antiquaries' Journal,* the journal of the Society of Antiquaries of London, is fully up to the level of the first number, and the publication marks a distinct advance in the popularisation of the science of archæology. Mr. A. Leslie Armstrong announces the discovery of engravings found at Grime's Graves, Norfolk, on flints associated with a series of flint implements of Le Moustier type, bone tools, and pottery, on a level immediately overlying glacial land. One is a naturalistic representation on flint-crust of a stag or perhaps an elk. The authorities at the Natural History Museum regard this animal as an elk, known in America as "moose." In the discussion which followed, the president suggested that the art of the engravings seemed to be of the same character as the French cave series, though he would not say the resemblance was conclusive. "In recent years discoveries at Grime's Graves, Northfleet, and elsewhere had reduced the sequence of prehistoric periods to a state of flux. If type, material, and coloration, singly or collectively, meant nothing at all, the whole structure of prehistoric study was undermined. In any case, the Grime's Graves industry did not seem to belong to the ordinary Neolithic period."

IN the April issue of *Man* Sir Ray Lankester describes, with illustrations, a remarkable flint implement found lying on the surface of a field within ten yards of the gravel-pit in which the jawbone of Eoanthropus was discovered in 1912. He proposes to call this specimen "the Piltdown batiform," and he expresses the hope that it may be placed with the other Piltdown flints in the Geological Department of the British Museum. He thus sums up the question:—"In my opinion the facts hitherto ascertained do not justify the identification of the period at which Eoanthropus lived with the period at which any of the flint implements discovered in the Piltdown gravel were fashioned, nor do we know enough to make the assertion that implements of Mousterian or Acheulæan or Chellæan or pre-Chellæan workmanship were *not* manufactured or in use when Eoanthropus flourished. Assuredly we are not in a position to assume either that Eoanthropus manufactured flint implements, or, on the other hand, that he did not do so. To me it seems improbable that Eoanthropus had anything to do with flint implements at all, although more likely that he suffered from them rather than that he benefited by their use."

IN an article on the conditions of cellular immortality (*Sci. Monthly*, vol. xii., No. 4, p. 321) Prof. Raymond Pearl discusses artificial parthenogenesis and tissue culture and the views regarding senescence to which they lead. The life of the unfertilised egg-cell can be prolonged only by fertilisation or by some other stimulus to development. The experiments of Leo Loeb, Harrison, Burrows, Carrel, and others in the culture not only of embryonic, but also of adult, tissues *in vitro* show that the phenomena of senescence do not originate in the cells themselves; for all the essential body-tissues, including heart-muscle, nerve-cells, spleen, connective tissue, and kidney-cells, have been shown to be capable of multiplication indefinitely by mitotic division outside the body. With improved methods Carrel has kept a strain of connective tissue from the chick's heart alive and growing for nine years. There is, therefore, a potential immortality not only of germ-cells, but also of tissue-cells, and senescence is a phenomenon of the differentiated body as a whole, due to the effects of the various types of cells upon each other.

IN the Journal of the Quekett Microscopical Club (vol. xiv., November, 1920) Mr. G. T. Harris describes the Desmid flora of a small area in East Devon, and compares it with that of Dartmoor in order to elucidate the influence of geological beds on the species density of the Desmid flora. Dartmoor is a Palæozoic, semi-mountainous area of extensive peat deposits, great rainfall, and deep bogs; the other, a Triassic, lowland area, with no peat-bogs, moderate rainfall, and unimportant bogs. The numerical results from each area were surprisingly similar, indicating that the factors influencing the richness or poverty of Desmid floras must be sought elsewhere than in the geological beds upon which the habitats stand; and a recent investigation of the Desmid flora of a district on Eocene beds confirms this statement. The species density of the two districts is also practically the same. A systematic list of the species and varieties from the Triassic area, 429 in number, is given. This adds 122 forms to the Desmid flora of Devonshire, bringing it up to a total of about 500 species and varieties. From gatherings made during the winter it would appear that most species in a southern county like Devon pass the winter in the vegetative state.

THE Forestry Commission in a recent report states that up to April it had acquired for planting 97,160 acres of land, of which 36,682 acres are in England and Wales, 54,972 acres in Scotland, and 5506 acres in Ireland. The area of 1586 acres planted under favourable conditions in 1919–20 continues to show satisfactory growth. During the 1920–21 season 6257 acres were planted at seventeen centres in England and Wales, nine centres in Scotland, and twelve centres in Ireland, while new nurseries have been established in various parts of the country. The Commission has published a report of the British Empire Forestry Conference held in London last July, which can be obtained through any bookseller or from H.M. Stationery Office (7*s*. 6*d*.). Leaflets on forest pests—No. 2, *Chermes Cooleyi*; No. 3, The Pine Shoot Beetle; and No. 4, *Hylastes ater*—can be obtained free on application to the Commission at 22 Grosvenor Gardens, London, S.W.1.

THE disposal of the debris from hydraulic mining and its influence on the lower courses of rivers have been urgent problems in California for the last half-century. A monograph on the subject by the late Dr. G. K. Gilbert is published by the United States Geological Survey entitled "Hydraulic Mining Débris in the Sierra Nevada" (Professional Paper 105). The material washed from the hillsides is carried by the creeks and rivers, and eventually finds lodgment in the lower reaches of the streams and during floods on the riparian lands, thus doing a considerable amount of harm to navigation and agriculture. For these reasons hydraulic mining has been severely restricted for many years. The bays of the San Francisco system have been sounded and mapped more than once, and comparisons made between early and recent maps show that the areas of the bays have been much reduced by the seaward growth of muddy shoals. Since the discovery of gold and the beginning of hydraulic mining more than 1,000,000,000 cubic yards of material have been deposited in the various bays. Dr. Gilbert made careful researches on the effect of this shoaling and diminution of area on the tidal currents and depths of water on the Golden Gate bar. The crest of the bar shows a retreat towards the land, but no reduction in depth since 1855, and the navigability of the bar has apparently not yet been affected.

IN the Journal of the Franklin Institute for April Mr. A. H. Armstrong considers the economic aspects of railway electrification in the United States. He points out that at the present time we are facing the facts of an eight-hour working day with overtime costing 50 per cent. more, greatly increased wages, fuel prices at levels never before reached, and maintenance costs at almost prohibitive values. With no immediate prospect in sight of any material reduction in the price of labour, its output must be increased, and electric operation effects this both on the railway line and in the workshop. The electrification of railways is a very costly operation, but the saving in operating expenses enables a reasonable return to be obtained on the capital expended. The argument for electrification, however, rests on a broader foundation than this. The national prosperity of America is bound up with the future growth of its transport system, and this growth depends on the adoption of electrification. An incidental advantage of electrification is that it would save one-sixth of all the coal mined in the United States.

THE fourth annual general meeting of the Society of Glass Technology was held at University College, London, on April 20, when Dr. Morris W. Travers was elected president in succession to Mr. S. N. Jenkinson. The new president delivered an address on the importance of quantitative investigation in dealing with technical glass problems. The speaker directed attention to the fact that the late Lord Moulton, who was to have presided at the society's dinner that evening, had brought about a great improvement in the efficiency of explosives factories by applying quantitative investigation to the processes conducted in them. The energy balance-sheet of a factory was as important as its financial balance-sheet, and the efficiency of a furnace, for instance, should be accurately known so that a full account could be given of all heat which entered it. This principle was illustrated by application to several furnace problems. There was also a wide field for investigations bearing on the nature of glass, and recent work had shown that glass in the solid condition resembled the elastic gels rather than the liquids. A paper on automatic glass-feeding devices was communicated by Messrs. G. Dowse and E. Meigh, and the society's third annual dinner followed. During the course of the evening the president referred to the proposed legislation affecting the industry, and maintained that the total prohibition of the importation of all chemical glassware except under licence was essential to that branch of the industry. Electric lamp bulbs should also have been included in the Bill. Assistance would be necessary if the manufacture of these articles were to be continued in this country.

MESSRS. G. E. STECHERT AND CO., 151 West 25th Street, New York (London: 2 Star Yard, Carey Street, W.C.2), have sent us a copy of their catalogue (New Series, xl.) of second-hand books relating to natural history. It contains some hundreds of titles, and is classified as follows:—General Natural Science; Agriculture, Forestry, Farming; Botany; Zoology; Ornithology; Ichthyology; Entomology; Gardening; and Supplement. The prices asked (in American dollars) appear to be very moderate.

AN interesting little catalogue (No. 414) of nearly four hundred works (books and engravings) on the topography of Kent and Sussex has just been issued by Mr. F. Edwards, 83 High Street, Marylebone, W.1. It will doubtless appeal to residents in the two counties named and to many others.

Our Astronomical Column.

COMETS.—It appears that Dubiago's comet was discovered by him at Kasan on April 24, and observed at Pulkovo a few days later. It has now been observed in England by Dr. Steavenson, whose observations enable the orbit to be improved. This has already been done approximately with the following result:—

T 1921 May 7·177 G.M.T., ω 100° 13′, ☊ 65° 58′, *i* 22° 20′, log *q* 0·0481.

Ephemeris for Greenwich Midnight.

		R.A.			N. Decl.		Log *r*	Log Δ
		h.	m.	s.	°	′		
May	28	9	38	57	35	52	0·0680	0·0172
June	1	10	0	27	33	18	0·0756	0·0179
	5	10	20	55	30	30	0·0840	0·0203
	9	10	40	22	27	32	0·0933	0·0250
	13	10	58	42	24	27	0·1032	0·0318
	17	11	16	3	21	20	0·1137	0·0406

Its total light is probably equal to a 9th magnitude star; it should be readily visible in an ordinary telescope in the absence of the moon.

The errors of the ephemeris of comet Pons-Winnecke have become so large that it is well to give the revised orbit lately received from Prof. Crawford and Miss Levy, with the ephemeris, for Greenwich midnight, deduced from it.

T 1921 June 12·95 G.M.T., ω 170° 34′, ☊ 97° 51′, *i* 18° 50′, log *q* 0·01703, *e* 0·6779, period (assumed) 5·8 years.

		R.A.			Decl.		Log *r*	Log Δ
		h.	m.	s.	°	′		
May	27	19	35	27	43	16 N.	0·0272	9·2698
	31	20	16	47	39	36	0·0230	9·2226
June	4	21	0	39	33	52	0·0198	9·1818
	8	21	44	21	26	4	0·0178	9·1537
	12	22	24	42	16	37	0·0170	9·1446
	16	23	0	20	6	50 N.	0·0175	9·1572
	20	23	31	5	2	14 S.	0·0192	9·1881
	24	23	56	42	9	55 S.	0·0221	9·2295

After this the comet will travel south rapidly; it should be observable in the southern hemisphere until September.

THEORY OF JUPITER'S SATELLITES.—Prof. Sampson's tables of Jupiter's satellites have been in use in the national ephemerides for several years, but the theory on which they were based has only just appeared in print, being vol. lxiii. of Memoirs of the Royal Astronomical Society. The author commences with a review of the work of Laplace, Delambre, Damoiseau, and Souillart; he explains that the discordances that still exist between the tables and observation are due to the fact that in deducing the fundamental elements with the aid of the older theories it was assumed that only the leading terms of these would be involved. It was discovered (too late to alter the tables) that some secondary terms in the older theories were so seriously wrong that the tables are sensibly affected. One such error may affect the time of an eclipse of Satellite IV. by 140s.

The elements at the present day were derived chiefly from the Harvard photometric observations of eclipses. These permit of the deduction of an exceedingly accurate value of the equatorial semi-diameter of Jupiter; the mean of the Harvard and Durham discussions is 18·927″.

The adopted value of Jupiter's mass is 1/1047·35, but it is noted that a discussion of recent measures and photographs in conjunction with the theory leads to the value 1/1047·0. It would, however, be rash to alter the accepted value, which rests largely on the perturbations of minor planets and the comet Pons-Winnecke.

One advantage of the delay in publishing the theory is that it has enabled a list to be given of the errata and omissions that have been detected. One such was found soon after the tables were printed, and a supplementary page was issued.

Mr. Innes directed attention to two omitted terms; one, due to the effect of the sun on Satellite IV., has a coefficient of 7·6″. The other is a long-period term; period for III. 26½ years, coefficient about 6″. The values for IV. are not very different.